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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/711,794

10/06/2004

Kuo-Yang Sun

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03/28/2005

NORTH AMERICA INTERNATIONAL PATENT OFFICE (NAIPC)

P.O. BOX 506

MERRIFIELD, VA 22116

EXAMINER

MANDALA, VICTOR A

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/711,794	<b>Applicant(s)</b> SUN ET AL.	
	<b>Examiner</b> Victor A. Mandala Jr.	<b>Art Unit</b> 2826	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 & 3-6 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,608,375 Terui et al.

1. Referring to claim 1, a package structure comprising: a lead frame, (Terui et al. Figure 36 & 37A-B #1722), having a plurality of first leads, (Terui et al. Figure 36 & 37A-B #1711), each of which includes a first recession, (Terui et al. Figure 36 & 37A-B area of #1711); at least a first device, (Terui et al. Figure 36 & 37A-B #1710); and a plurality of solder joints, (Terui et al. Figure 36 & 37A-B #1712), respectively positioned in the first recessions, (Terui et al. Figure 36 & 37A-B area of #1711), for connecting the first device, (Terui et al. Figure 36 & 37A-B #1710), to the lead frame, (Terui et al. Figure 36 & 37A-B #1722).
2. Referring to claim 3, a package structure, wherein the first device is a passive device, (Terui et al. Figure 36 & 37A-B #1710 & Col. 23 Line 4).
3. Referring to claim 4, a package structure, wherein the passive device is an electrical resistor, a capacitor, or an inductor, (Terui et al. Figure 36 & 37A-B #1710 & Col. 23 Line 4).
4. Referring to claim 5, a package structure, wherein the lead frame comprises a plurality of second leads, (Terui et al. Figure 36 & 37A-B #1722).

Art Unit: 2826

5. Referring to claim 6, a package structure, wherein the package structure further comprises a plurality of leading wires, (Terui et al. Figure 36 & 37A-B #1704), and at least a second device, (Terui et al. Figure 36 & 37A-B #1703), for connecting the leading wire, (Terui et al. Figure 36 & 37A-B #1704), to the second leads, (Terui et al. Figure 36 & 37A-B #1722).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,608,375 Terui et al. in view of U.S. Patent No. 6,127,206 Nakamichi.

7. Referring to claim 7, a package structure, wherein the lead frame comprises a plurality of second leads, (Terui et al. Figure 36 & 37A-B #1722 & Nakamichi Figures 1-4 #16), each of which includes a second recession, (Nakamichi Figures 1-4 #18 & see \*\* below).

\*\* Terui et al. teaches all of the claimed matter in claim 7, but is silent on the plurality of second leads having a recession. Nakamichi does teach a recession on leads in Figures 1-4 #18. It would have been obvious to one having skill in the art at the time the invention was made to combine the teachings of Terui et al. with the teachings of Nakamichi because make leads with a recession in the area of a wire bond increase bonding surface area which strengthens the bond and increases the durability of the device, Nakamichi Col. 2 Lines 20-22.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 & 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,608,375 Terui et al. in view of U.S. Patent No. 6,127,206 Nakamichi in further view of U.S. Patent No. 5,682,057 Kuriyama.

8. Referring to claim 8, a package structure, wherein the package structure comprises at least one second device, (Terui et al. Figure 36 & 37A-B #1703), and a plurality of second solder joints, (Terui et al. Figure 36 & 37A-B #1722 & Nakamichi Figures 1-4 #16 and see \*\*\* below), respectively positioned in the second recessions, (Nakamichi Figures 1-4 #18 & see \*\* above), for connecting the second device to the lead frame, (Terui et al. Figure 36 & 37A-B #1722 & Nakamichi Figures 1-4 #16).

\*\*\* Terui et al. and Nakamichi teaches all of the claimed matter in claim 8, but is silent on the exact interpretation of solder, but teaches wire bonding. Kuriyoma teaches the process of wire bonding to a lead where the lead is of a solder type material. It would have been obvious to combine the teachings of Terui et al. in view of Nakamichi in further view of Kuriyoma, (Col. 1 Lines 63-67 & Col. 2 Lines 1-10), since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

In re Leshin, 125 USPQ 416.

Art Unit: 2826

9. Referring to claim 9, a package structure, wherein the second device is a semiconductor die and the second solder joint is composed of tin or tin alloy, (Kuriyoma Col. 1 Lines 63-67 & Col. 2 Lines 1-10 and see \*\*\* above).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, & 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,127,206 Nakamichi in view of U.S. Patent No. 5,682,057 Kuriyama.

10. Referring to claim 1, a package structure comprising: a lead frame, (Nakamichi Figures 1-4 #1), having a plurality of first leads, (Nakamichi Figures 1-4 #16), each of which includes a first recession, (Nakamichi Figures 1-4 #18); at least a first device, (Nakamichi Figures 1-4 #20); and a plurality of solder joints, (Nakamichi Figures 1-4 area of #24 and see \*/\* below), respectively positioned in the first recessions, (Nakamichi Figures 1-4 #18), for connecting the first device, (Nakamichi Figures 1-4 #20), to the lead frame, (Nakamichi Figures 1-4 #1).

\*/\* Nakamichi teaches all of the claimed matter in claim 8, but is silent on the exact interpretation of solder, but teaches wire bonding. Kuriyoma teaches the process of wire bonding to a lead where the lead is of a solder type material. It would have been obvious to combine the teachings of Terui et al. in view of Nakamichi in further view of Kuriyoma, (Col. 1



Art Unit: 2826

Lines 63-67 & Col. 2 Lines 1-10), since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

In re Leshin, 125 USPQ 416.

11. Referring to claim 2, a package structure, wherein the first device is a semiconductor chip, (Nakamichi Figures 1-4 #20 & Col. 4 Lines 47-48):

12. Referring to claim 10, a package structure, wherein the lead frame, (Nakamichi Figures 1-4 #1), comprises a die pad, (Nakamichi Figures 1-4 #12), connected to the first device, (Nakamichi Figures 1-4 #20), for radiating the heat produced by the first device, (Nakamichi Figures 1-4 #20), by serving as a heat sink, (it is inherent since #12 is a conductive material and that all conductive material dissipate heat).

13. Referring to claim 11, a package structure, wherein the chip sink includes a ground pad, (Nakamichi Figures 1-4 #12 and Col. 6 Lines 1-3), connected to both ground and the first device, (Nakamichi Figures 1-4 #20).

14. Referring to claim 12, a package structure, wherein the first solder joint is composed of tin or tin alloy, (Kuriyoma Col. 1 Lines 63-67 & Col. 2 Lines 1-10 and see \*/\* above).

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 5,834,831 Kubota et al.

Art Unit: 2826

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor A. Mandala Jr. whose telephone number is (571) 272-1918. The examiner can normally be reached on Monday through Thursday from 8am till 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

~~NATHAN J. FLYNN~~  
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VAMJ  
3/19/05